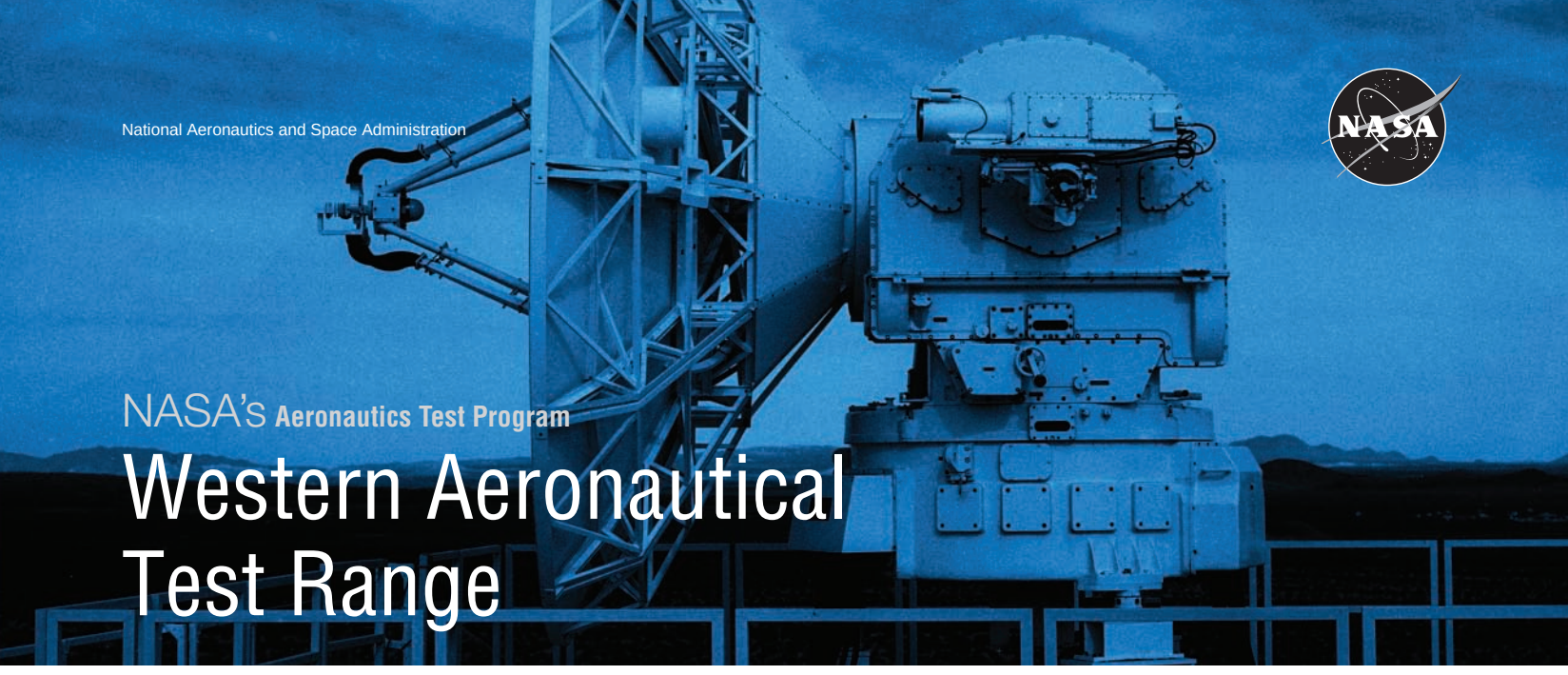
National Aeronautics and Space Administration

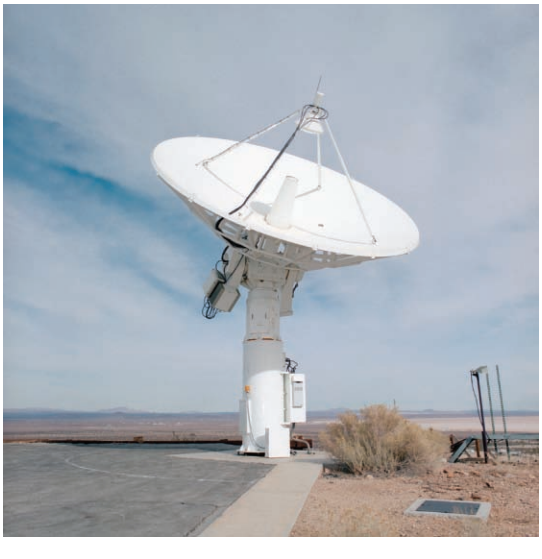


NASA's **Aeronautics Test Program**

Western Aeronautical Test Range

NASA's Western Aeronautical Test Range (WATR) supports aerospace flight research and technology integration, space exploration concepts, airborne remote sensing, and a wide variety of science missions.

Part of the Dryden Flight Research Center, located at Edwards Air Force Base, the mission of the WATR is to support flight research operations and low-Earth-orbiting missions. WATR supplies a comprehensive set of resources for the control and monitoring of flight activities, real-time acquisition and reduction of research data, and effective communication of information to flight and ground crews.



Facility Benefits

- Precision RADAR provides time-space positioning information (TSPI) for aerospace flight research.
- Fixed and mobile telemetry antennas receive real-time data, video data, and transmit uplink from and to the research vehicle and relay this data to telemetry processing areas.
- The processed data is displayed at the engineering stations in the mission control center and archived in a post-flight storage area.

- Audio communication networks support aeronautics research and space operations in the WATR, covering a broad frequency spectrum for transmitting and receiving voice communications and flight termination signals for unmanned aerial vehicles.
- Video monitoring provides real-time and recorded data for the control and safety of flight test missions.

Facility Applications

The WATR supports aerospace flight research and technology integration, space exploration concepts, airborne remote sensing and science missions, and space shuttle and International Space Station operations.

Characteristics

The WATR Mission Control Center

- 26 test engineering stations including communications (radio and intercom) panels, video monitors, weather data, Inter-Range Instrumentation Group (IRIG)–B timing, and specialized graphics displays
- Range and mission control, test operations, range safety, and test director consoles provide critical analysis and display capabilities.

The WATR mobile systems

- Available for rapid deployment to a speci ed location on short notice. These systems provide
  - Radio frequency (RF) communication
  - Video and telemetry-tracking support for test missions outside local airspace boundaries

Data Acquisition and Processing

- Data is acquired and merged from multiple sources in various formats to a single, time-correlated, composite stream for processing, distribution, real-time display, and storage archival. Segments of post-mission data are immediately available on portable media.
- Post-flight RADAR data is provided in the appropriate engineering parameters.

Telemetry tracking systems

- Multiple xed antennas
  - Downlinked telemetry and video signals in C-, L-, and S-bands
  - Uplinked commands in either L- or S-bands
  - Targets tracked from horizon to horizon
  - Certi ed for full on-orbit capability—downlinked telemetry may be received in either analog or digital format
  - 45 mph wind restriction
- Available mobile systems for deployment

RF Communications

- More than 40 ultra-high-frequency (UHF), very-high-frequency (VHF), and high-frequency (HF) transmitter receivers
- UHF flight termination system (three systems available in 2010)
- Extensive range intercommunication system consists of
  - Trunk lines
  - Communication panels
  - Public address systems
  - Commercial telephone systems
  - Military ground-communication networks
- An integrated communications system including
  - Ground-based ber optics
  - Orbital satellites
- Satellite communication capability
  - Used to relay telemetry, RADAR, audio, and video data among Dryden facilities, NASA centers, other Government agencies, and industry partners

RADAR

- Two high-accuracy C-band instrumentation RADARs
- Track targets out to a distance of 3000 nautical miles with accuracies to 0.0006° and 30 ft in range
- Accept acquisition data in various formats
- 55 mph wind limit restrictions

Video

- Numerous xed and mobile camera systems
- Operational video data for flight monitoring, safety, and mission control
- Long-range, broadcast-quality, high-de nition optical system providing day and night (including infrared) coverage of local airspace
- Coverage of the flight line, ramp areas, and runways
- Mobile video vans
  - Capability to relay live-action imagery via microwave links
  - Capability to relay live action imagery via ground video van C-band telemetry uplink
  - Downlinked video from research vehicles or chase aircraft can be received in C-, L-, or S-band frequencies
  - Video recording is provided on VHS, super VHS, beta superior performance, DVD, and other high-de nition media

Contact Information

www.aeronautics.nasa.gov/atp
Robert Sakahara
Test Systems Program Manager
Dryden Flight Research Center
661–276–2566
E-mail: robert.d.sakahara@nasa.gov

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